



Gastrostomy Placement (Open and Laparoscopic Approach)

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Indications and Benefits

- Malnutrition, failure to thrive, decreased oral intake, feeding intolerance, oral aversion, need for long-term enteral access
- Dysphagia/aspiration, neurologic impairment
- Esophageal atresia, intestinal discontinuity, gastric decompression
- Benefits: Provides long-term enteral access for nutritional support, ease of administration of enteric medications, more comfortable and durable as compared to nasogastric feeding access

Risks and Alternatives

- Standard risks (bleeding, infection, need for additional procedures, risks of sedation/anesthesia)
- Injury to adjacent structures (intra-abdominal organs)
- Leakage around gastrostomy tube, dislodgment of the gastrostomy tube (early postoperatively can lead to leakage into the peritoneal

cavity, later can lead to buried bumper syndrome, or complete externalization of the tube), tube malfunction (including clogging, cracks in the tubing, breaks in the balloon leading to the tube falling out of the patient requiring replacement), distal displacement or distal initial placement leading to gastric outlet obstruction.

- Alternatives: long-term nasogastric feeding access

Essential Steps

1. Appropriate position of the gastrostomy on the abdominal wall to decrease future complications
2. Confirmation of intra-luminal placement of the enterostomy tube
3. Securing the stomach to the abdominal wall (Stamm technique)
4. Snugging the external bumper but not overtightening
5. Securing the tube externally with a suture, dressing to buttress the tube, or in combination
6. Careful management postoperatively to include avoidance of torquing the tube, avoidance of overtightening the external bumper, and local wound care to avoid excess moisture on the skin leading to skin breakdown and wound issues

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Note These Variations

- Use of endoscopy to perform laparoscopic-assisted PEG placement or confirmation of intraluminal location of enterostomy balloon (see Chap. 10).

Template Operative Dictation (Open)

Preoperative Diagnosis Need for long-term enteral access due to ___

Postoperative Diagnosis Same as preoperative diagnosis

Findings *Stomach amenable to gastrostomy tube placement*

Procedure(s) Performed *Laparoscopic/open gastrostomy placement*

Anesthesia *General anesthesia*

Specimens none

Drains none

Implants gastrostomy (___ French, ___ cm, *tube/button type, secured at ___ cm*)

Estimated Blood Loss *none/minimal/___ mL.*

Indications This is a ___ *day-/week-/month-/year-old male/female* who presents to the operative suite for placement of gastrostomy tube due to feeding difficulty secondary to ___.

Procedure in Detail Following satisfactory induction of general anesthesia, the patient was placed in a supine position and padded appropriately. A timeout was performed using both pre-induction and pre-incision safety checklists with participation of all present in the operative suite. These confirmed the correct patient, procedure, operative site, and additional critical information prior to the start of the procedure. The abdomen

was prepped and draped in a normal sterile fashion and appropriate preoperative antibiotics were administered prior to incision.

[Choose One:]

Laparoscopic gastrostomy tube placement: The subcostal margin on the left was identified and a line was drawn one fingerbreadth below this to mark an appropriate position for a feeding tube prior to insufflation. A location approximately 1–2 cm to the left of midline along this line was deemed an appropriate position for the gastrostomy tube and marked. An umbilical incision was then created and dissection carried down to the level of the umbilical stalk and fascia. This was grasped and elevated. An incision was carried out on the fascia and while lifting with a clamp on the umbilical stalk, a Veress needle was inserted into the abdomen and a saline drop test was reassuring for intraperitoneal placement. The abdomen was insufflated to a pressure of 12 mm Hg. A 5 mm port was then inserted at this umbilical site. The abdomen was inspected and ensured that no injury occurred from initial port placement.

The stomach was visualized and appeared adequate for gastrostomy tube placement. A small finder needle was used at the previously marked location and was clamped at the skin level immediately upon being visualized at the level of the peritoneum. This length was then measured and 4 mm added to this measurement (typical thickness of the stomach) to determine the length of the low-profile gastrostomy button tube. Under direct visualization, a 5 mm port was placed at the previously marked location for the gastrostomy tube. A bowel grasper was used through the left upper quadrant port to grasp the stomach along the greater curvature of the stomach approximately two-thirds of the way from the gastroesophageal junction to the pylorus. This area of the stomach reached the port site and was grasped firmly. The abdomen was desufflated and the left upper quadrant port was removed while maintaining the grasper on the stomach. The stomach was carefully externalized through the port site and a 2-0 stay suture was placed as a stay suture and a snap was placed on the suture. The grasper was then removed from

the field. A 3-0 absorbable braided purse-string suture was placed widely on the stomach and directed inferiorly from the stay suture to allow sufficient room for the gastrostomy site. This was placed to a straight snap. Two Stamm sutures were placed, one lateral and one medial. 3-0 absorbable braided sutures were used for this and they were placed from fascia to stomach (outside the purse-string) and then back to fascia. They were placed to curve snaps and placed to the corresponding side of the patient.

The abdomen was then insufflated and the laparoscope was inserted and the area of the stomach to be used for the gastrostomy was visualized. A needle was placed into the stomach within the purse-string and just below the stay suture. Aspiration of air or gastric contents was achieved and then a flexible guidewire placed through the needle. This appeared to be within the stomach on laparoscopy. The needle was backed off of the guidewire and then a Seldinger technique was used with a series of well-lubricated dilators passing easily into the stomach under direct visualization. Once dilated to a size 16 French dilator, the 14 French low-profile gastrostomy button was then passed over the guidewire and passed easily into the stomach. The balloon was inflated with sterile water to 5 mL and appeared to be within the stomach. The guidewire was removed and the appropriate tubing connected to the gastrostomy tube and a large syringe was used to inject 30–60 mL of air into the stomach. This visually inflated the stomach and aspiration decompressed the stomach.

Having completed all confirmatory testing of intra-gastric location, the stay suture was removed and then the purse-string suture was tied followed by the Stamm sutures. These were then trimmed short and the abdomen was desufflated. The fascia at the umbilical port site was closed with 3-0 braided absorbable suture and the skin closed with *deep dermal 5-0 braided* absorbable suture and sterile dressing applied. The gastrostomy tube was then secured with a dressing and left to a gravity bag.

Open gastrostomy tube placement: The subcostal margin on the left was identified and a line was drawn one fingerbreadth below this to mark

an appropriate position for a feeding tube prior to insufflation. A location approximately 1–2 cm to the left of midline along this line was deemed an appropriate position for the gastrostomy tube and marked. A small upper midline/upper transverse laparotomy was performed. The abdomen was entered safely and the stomach identified. A location two-thirds of the way from the gastroesophageal junction to the pylorus along the greater curvature was identified as a suitable location for gastrostomy tube placement, and it was ensured that this would reach the abdominal wall at the previously marked location without tension. A 3-0 silk purse-string was placed at this location on the stomach wall. The previously marked location for gastrostomy tube was incised and the abdomen was bluntly entered with a hemostat while protecting the viscera with a malleable retractor. A hemostat from inside the abdomen was snapped to the transabdominal hemostat and passed through the abdominal wall. A 14 French gastrostomy tube was grasped and pulled through the abdominal wall. The balloon was checked for patency by instilling sterile water in the balloon port and then desufflated. Within the purse-string suture, a full thickness gastrostomy was created with cautery and gastric contents were encountered. The gastrostomy tube was inserted into the stomach and the purse-string was tied down. The balloon was inflated with 5 cc of sterile water and was felt to be within the stomach and patent. Two Lembert sutures were placed on either side of the tube with 3-0 silk, taking care to avoid the balloon. Four 3-0 silk Stamm sutures were placed from the abdominal wall to the seromuscular portion of the stomach outside of the purse-string suture, beginning with the lateral suture, which was snapped with an identifying hemostat. These sutures were then tied down beginning with the lateral suture. These sutures were trimmed and again the balloon was confirmed to be intact and the gastrostomy tube was instilled with air and then aspirated to confirm appropriate functionality. The skin level on the tube was noted and the tube was secured to the skin with 3-0 nylon suture. The fascia was closed with running 3-0 braided absorbable suture, and then the skin was closed with running subcuticular 5-0 braided

absorbable suture and sterile dressings applied. The external bumper was placed snugly but not tight. The gastrostomy tube was then secured with a dressing and left to a gravity bag.

Laparoscopic-assisted percutaneous endoscopic gastrostomy (PEG) tube placement: The subcostal margin on the left was identified, and a line was drawn one fingerbreadth below this to mark an appropriate position for a feeding tube prior to insufflation. A location approximately 1–2 cm to the left of midline along this line was deemed an appropriate position for the gastrostomy tube and marked. An umbilical incision was then created and dissection carried down to the level of the umbilical stalk and fascia. This was grasped and elevated. An incision was carried out on the fascia and while lifting with a clamp on the umbilical stalk, a Veress needle was inserted into the abdomen and a saline drop test was reassuring for intraperitoneal placement. The abdomen was insufflated to a pressure of 12 mm Hg. A 5 mm port was then inserted at this umbilical site. The abdomen was inspected and ensured that no injury occurred from initial port placement.

Attention was then turned to performing a complete esophagogastroduodenoscopy being sure to exclude gastric outlet obstruction. The stomach was fully insufflated and distended. The greater curvature was identified endoscopically and the area of light transillumination was seen from the endoscope by laparoscopy. The previously marked area on the abdominal wall was within a reasonable distance to pass a needle from this site into the stomach near the greater curvature of the stomach away from the pylorus. The needle was visualized entering the stomach

by the endoscope. An endoscopic snare was placed around the needle prior to deploying the guidewire. Adequate guidewire length was passed into the lumen of the stomach and grasped with the snare. The needle was then backed out over the wire. A stab incision with an 11-blade scalpel was used on the skin around the wire. The entire endoscope was removed while continuing to hold the guidewire with the snare. The guidewire was then looped around a 16 French PEG tube and snugged to the loop in the guidewire. Lubrication was placed around the PEG tube. The guidewire and PEG were then pulled from the abdominal side of the patient until snug in the stomach. The location of the PEG at the skin level was noted. Repeat upper endoscopy showed the internal bumper to be in a good position, not causing outlet obstruction, and with no signs of bleeding. The stomach was completely aspirated. The endoscope was slowly withdrawn and the esophageal mucosa was examined to ensure no iatrogenic injury. The external bumper was then applied and placed snug but not tight at the skin level and a dressing applied. The PEG tube was cut to an appropriate length and attached to a drainage bag. The umbilical stalk and fascia were closed with 2-0 absorbable braided suture, and the skin at the umbilicus was closed with a deep dermal 4-0 absorbable braided suture and a sterile dressing applied on top of this.

Upon completion of the procedure, a debriefing checklist was completed to share information critical to the postoperative care of the patient. The patient tolerated the procedure well, *was extubated in the operating room*, and was transported to the post-anesthesia care unit in stable condition thereafter.